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SCIENCE

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CONTENTS

<i>Disease Resistance in Plants:</i> DR. OTTO APPEL.	773
<i>The Cavern of the Three Brothers:</i> PROFESSOR GEORGE GRANT MACCURDY	782
<i>Some Earthquake Phenomena noted in Panama:</i> DR. DONALD F. MACDONALD	783
<i>The Thomas Say Foundation</i>	784
<i>Awards of the Franklin Medal</i>	785
<i>Scientific Notes and News</i>	785
<i>University and Educational News</i>	790
<i>Discussion and Correspondence:</i> —	
<i>Zoologists, Teachers and Wild Life Conservation:</i> PROFESSOR CHAS. C. ADAMS. <i>An Eye Screen for Use with the Microscope:</i> ORTON L. CLARK. <i>Exhibition of the Royal Photographic Society:</i> DR. C. E. K. MEES.	790
<i>Scientific Books:</i> —	
<i>Greenhill's Report on Gyroscopic Theory:</i> PROFESSOR D. E. SMITH. <i>Russell on Soil Conditions and Plant Growth:</i> DR. FRANK K. CAMERON	793
<i>Shark Intoxication:</i> DR. A. H. CLARK	795
<i>Special Articles:</i> —	
<i>The Crown-gall of Alfalfa:</i> DR. ORVILLE T. WILSON. <i>The Food Habits and Distribution of the Texas Horned Lizards:</i> W. M. WINTON	797
<i>The American Association for the Advancement of Science:</i> —	
<i>Section D—Mechanical Science and Engineering:</i> PROFESSOR ARTHUR H. BLANCHARD.	798

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DISEASE RESISTANCE IN PLANTS¹

THE control of fungous diseases in plants may be effected in three different ways: (1) By killing the parasite before it enters the host, (2) by curing the diseased plants, and (3) by growing disease-resistant varieties of cultivated plants or making the susceptible varieties resistant. So far the first method is the one most generally followed, the means employed depending on the nature of the fungus.

It is easier to protect the host from a fungus which combines a highly developed parasitic character with alternation of hosts than from one which spends its entire life cycle on the same host. For example, when rust (*Ræstelia cancellata*) appears in a pear orchard the danger from it may be done away with by removing all juniper trees from the neighborhood, the juniper being the host for the alternate stage of the fungus (*Gymnosporangium sabinæ*). The same measure may be adopted in the case of red rust of wheat (*Puccinia graminis*) in countries in which the fungus does not reinfect directly the wheat but grows in the spring on the barberry (*Berberis*). This disease has practically disappeared from Germany since the removal of all barberry and mahonia bushes from the vicinity.

The destruction of a fungus living on one host only is more difficult because of the fact that this may necessitate the destruction of all diseased plants or parts of them, an undertaking which could hardly be carried out completely. However, if carried

¹ A lecture delivered by invitation at the universities of California, Wisconsin, Minnesota and Cornell, and the Iowa Agricultural College, in October, 1914.